REMARKS/ARGUMENTS

Claims 1-38 are pending in the present application.

This response is in response to the Office Action mailed August 12, 2005. In the Office Action, the Examiner rejected claims 1-38 under 35 U.S.C. §101, second paragraph; claims 1-38 under 35 U.S.C. §112; and claims 1-38 under 35 U.S.C. §102(b). Reconsideration in light of the remarks made herein is respectfully requested.

Rejection Under 35 U.S.C. § 101

1. In the Office Action, the Examiner rejected claims 1-38 under 35 U.S.C. §101 on the grounds that the claims are directed to an abstract idea which is non-statutory subject matter. Applicant respectfully traverses the rejection for the following reasons.

In the Office Action, the Examiner stated that "[t]he claims merely recite a 'method' comprising pruning local graphs without further describing what the pruning steps is and/or how the pruning steps is performed creating any functional interrelationships among the [pruning] steps" (Office Action, page 2, paragraph number 4). The Examiner further stated that "[s]imply reciting what the local graphs are does not provide any functional interrelationships with the pruning steps." (Office Action, pag3 3, paragraph number 4). The Examiner then concludes that "Thus the claims represent non-functional descriptive material that is not capable of producing a useful result, and hence represent only abstract ideas. Therefore, the claims are non statutory." (Office Action, page 3, paragraph number 4). Applicant respectfully disagrees for the following reasons.

The claimed process is statutory if it is limited to a practical application of the abstract idea or mathematical algorithm in the technological arts. See *Alappat*, 33 F.3d at 1543, 31 USPQ2d at 1556-57 (quoting *Diamond v. Diehr*, 450 U.S. at 192, 209 USPQ at 10). See also *Alappat* 33 F.3d at 1569, 31 USPQ2d at 1578-79 (Newman, J., concurring) ("unpatentability of the principle does not defeat patentability of its practical applications") (citing *O'Reilly v. Morse*, 56 U.S. (15 How.) at 114-19). A claim is limited to a practical application when the method, as claimed, produces a concrete, tangible and useful result; i.e., the method recites a step or act of producing something that is concrete, tangible and useful. See *AT&T*, 172 F.3d at 1358, 50 USPQ2d at 1452.

Here, the claims recite pruning local graphs representing local problems which correspond to separately compilable components in a software program. Pruning local graphs representing local problems is limited to a practical application of inter-procedural analysis (IPA) solver. It provides a concrete result to optimize the IPA process for separately compilable software entities. Separately compilable components correspond to tangible and useful result, not abstract ideas. The local-interprocedural problems are constructed for each translation unit, reduced, and merged together into a global problem to be solved. Therefore, they represent useful results for the translation unit arts. The claims recite manipulation (e.g., pruning) of concrete entities (e.g., local graphs representing local problems which correspond to separately compilable components). Therefore, they are statutory.

Accordingly, Applicant respectfully requests the rejection under 35 U.S.C. §101 be withdrawn.

Rejection Under 35 U.S.C. § 112

2. In the Office Action, the Examiner rejected claims 1-38 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

The Examiner states that it is unclear which one of the step and the data structure further describe the method in claim 1 (Office Action, page 3, paragraph number 6). Applicant respectfully disagrees. Pruning local graphs clearly define the operation of "pruning". Applicant respectfully directs the Examiner's attention to the Specification, paragraph [0034] which describes the local graph pruning module 142 and the IPA solver used to optimize the IPA process for separately compilable software entities.

The Examiner further states that the term "separately compilable components" is unclear whether it is meant to be "separately compiled components" or any components that can be separately compilable if kept in separate files (Office Action, page 3, paragraph number 6). A separately compilable component may represent any component that can be separately compiled such as a function, a procedure, a module, a package, or a class. The Examiner further states that the term "separately compilable components" does not necessarily indicate that the components are separately compiled, and the compilation is directed to an intended action, not an actually performed action. However, this is not relevant to the 112 rejection. The term "separately compilable" refers to the characteristic of the component. It is used to characterize what the component is.

Therefore, Applicant respectfully requests the rejection under 35 U.S.C. §112 be withdrawn.

Rejection Under 35 U.S.C. § 102

3. In the Office Action, the Examiner rejected claims 1-38 under 35 U.S.C. §102(b) as being anticipated by "Interprocedural Constant Propagation Using Dependence Graphs and a Data-Flow Model" ("Brinkley"). Applicant respectfully traverses the rejection and contends that the Examiner has not met the burden of establishing a prima facie case of anticipation.

Brinkley discloses an interprocedural constant propagation using dependence graphs and a data-flow model. The technique attempts to reduce the number of intermediate representations by unifying optimizations onto a common intermediate representation. The representation chosen is a variation of the program dependence graph, called the system dependence graph (SDG) (Brinkley, second paragraph, section 1, Introduction). The optimization is inter-procedural constant propagation. The goal is to identify variables whose values are constant throughout all possible executions of the program (Brinkley, third paragraph, section 1, Introduction).

Brinkley does not disclose, either expressly or inherently, (1) pruning local graphs representing local problems, the local problems corresponding to separately compilable components in a software program, (2) each of the local graphs having edges and vertices, each edge having a transfer function, each vertex having a value, and (3) values of each of the local graph forming a lattice under a partial ordering.

Brinkley merely discloses a SDG which contains one procedure dependence graph (PDG) for each procedure in a system S connected by inter-procedural control- and flow-dependence edges. The PDG for procedure P contains vertices, which represent the components of P, and edges, which represent the dependence between these components (Brinkley, third paragraph, section 2.1, The System Dependence Graph). Therefore, the PDG is not a local graph representing local problems that correspond to separately compilable components in a software program. It is a graph for each procedure and the edges merely represent the dependence between the components, not a transfer function. The vertex represents the predicates of if and while statements, assignments statements, input statements, and output statements of P (Brinkley, third paragraph, section 2.1, The System Dependence Graph). Therefore, it does not have a value.

Furthermore, Brinkley merely discloses an inter-procedural constant propagation. The technique involves adding the call-site rewrite rule to the inter-procedural algorithm (Brinkley, first paragraph, section 3.2, Interprocedural Constant Propagation). The call-site rule introduces copies of vertices (Brinkley, section 2.2, first paragraph under heading "Rewriting the SDG"). Since the vertices are copied, the graph is not pruned.

To anticipate a claim, the reference must teach every element of the claim. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Vergegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ 2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the...claim." Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ 2d 1913, 1920 (Fed. Cir. 1989). Since the Examiner failed to show that Brinkley teaches or discloses any one of the above elements, the rejection under 35 U.S.C. §102 is improper.

Therefore, Applicant believes that independent claims 1, 15, and 29 and their respective dependent claims are distinguishable over the cited prior art references. Accordingly, Applicant respectfully requests the rejection under 35 U.S.C. §102(b) be withdrawn.

Conclusion

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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